Evidence for Late Antique Bone and Ivory Carving on the Northeast Slope of the Palatine: The Palatine East Excavation

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Excavation of the northeast slope of the Palatine Hill, immediately southwest of the Arch of Constantine and in the lee of the great terrace of the so-called Temple of Heliogabalus, began in 1989 under the joint sponsorship of the American Academy in Rome and the Soprintendenza archeologica di Roma.[1] It is one of several projects initiated by the Italian government in collaboration with foreign institutions during the 1980s. The excavation has two primary goals. The first is to investigate the extensive late Roman *domus* located approximately 40 meters southwest of the Arch of Constantine. The second is to document a complete stratigraphic sequence of the Palatine, from the terrace of the Temple of Heliogabalus above to the Arch of Constantine below. Such a diachronic picture of the Palatine would be invaluable in the study of the ancient and medieval city, providing data acquired with a consistent methodology for an extensive area over the course of nearly two millennia. Excavation to date has been carried out for five seasons of approximately ten weeks each, with teams numbering between forty and fifty people.[2]

The major architectural feature of the site is the extensive late antique *domus* and ancillary structures that occupy a very large triangular insula of the city that stretches on its longest side approximately 110 meters behind the row of shops that faced the street under the present Via di San Gregorio (Figs. 1, 2).[3] The *domus* rests on and incorporates mid and late republican remains, including a series of late republican houses, as well as wall fragments of probable Neronian and Flavian date that may offer hints as to the extent of Nero's Domus Aurea and the successive Vespasianic reorganization of the cityscape. Later Antonine and Severan structures, including a frescoed and mosaic-paved room of the first half of the third century, were enclosed in the construction of the large *domus,* which is assigned to the second half of the third century A.D.—before Diocletian—on the basis of techniques of construction. It is distinguished by its large apsidal *aula* or reception hall (approximately 11 × 22 meters), a series of curvilinear rooms to the south,

[1]The excavation has been generously supported by the Alexander Abraham Foundation, the John and Emily Harvey Foundation, the Kress Foundation, Rutgers University, the University of Illinois at Champaign-Urbana, and Indiana University. Support for the documentation of the bone and ivory material was provided by a Project Grant from the Trustees of Harvard University/Dumbarton Oaks. I wish to thank the director of the excavation, Eric Hostetter, and Rasmus Brandt, David Reese, Anthony Cutler, and Dale Kinney, who have provided special support and expertise in the study of the bone and ivory remains. Joseph Connors and Caroline Bruzelius have generously provided the space and support at the American Academy that has made the study of the vast amounts of excavated materials possible.

[2]For preliminary reports of the excavation, see E. Hostetter et al., "Scavi e Scoperte: Palatino. Versante nordorientale," *Bollettino di Archeologia* 9 (1991), 47–56; E. Hostetter et al., "A Late Roman *Domus* with Apsidal Hall on the NE Slope of the Palatine: 1989–1991 Seasons," *Rome Papers,* Journal of Roman Archaeology Supplementary Series, no. 11 (1994), 131–81. Final publication of Phase I of the excavation, 1989–94, is in progress.

[3]For a preliminary discussion of the *domus* (1989–92), see Hostetter et al., "A Late Roman *Domus,*" 133–53.

which were conventionally assigned more private functions, and a series of large vaulted chambers upslope to the west. Excavations conducted in 1992 and 1993 upslope and to the northwest of the *domus* complex proper (Fig. 1) also revealed late republican and early imperial constructions beneath fourth- and fifth-century deposits, including a fountain complex. The relation of the fountain complex and associated structures to the *domus* has not yet been established. The fountain, which underwent several design changes, appears to have faced west, however, suggesting the possibility that it was a public fountain outside the upslope wall of the *domus,* facing a north-south clivus ascending the Palatine.

Evidence for the decline and abandonment of the *domus* is staggered. Beginning at the end of the third century, the southern rooms were deliberately filled in, but parts of the complex continued to be used in late antiquity and the middle ages. Alterations were made to the apsidal hall, for example, and the third-century frescoed room was overpainted in imitation *opus sectile* in the late fourth or fifth century, after which it received Greek graffiti. Continued occupation is attested also by the insertion in various places of walls constructed of *spolia,* including marble sculptural and architectural fragments, and by a series of crude structures associated with the early medieval assemblages in the courtyard north of the apsidal hall.[4] Since sites preserving late antique through early medieval stratigraphy in Rome very rarely have been excavated and documented, this evidence is of considerable importance.

An important focus of the Palatine East project has been the documentation and analysis of the more than 1500 bone and ivory objects unearthed during the five seasons of excavation. These finds constitute by far the largest and most varied collection unearthed for the city of Rome, and possibly the entire western Mediterranean area. The range of types of objects is wide and varied, both in form and quality of execution, and the chronological distribution is wide, from the first through at least the sixth century. Of exceptional interest, however, is the concentration of this material in a series of layers in stratigraphic sequence dumped over and around the walls to the south of the apsidal hall from the second quarter of the fourth through the first half of the fifth century A.D. Based on the evidence of large groups of pottery found in association with this material, it is clear that each layer displays an impressive degree of chronological coherence and probably represents no more than several decades. Continued excavation has produced a large number of finds of ivory and bone similarly associated with groups of pottery dating to the later third or early fourth century and, from the barrel vaulted chambers beneath the apsidal hall, possibly spanning the entire fifth and part of the sixth centuries.

While examination of this more recently excavated material is in the preliminary stages, it should prove possible to expand to ca. 300–500–plus the period of time for which reliable data are available.[5] In addition, excavations carried out in 1992 and 1993 upslope in the area of the fountain complex, although on a smaller scale, so far have produced more than 250 objects, primarily of bone, but including ivory, concentrated in what appear to be coherent late-first- and early-second-century deposits, providing valuable comparanda for the more extensive late antique material. This unique situation for the time and place makes it possible to analyse a large body of evidence within a reliable and broad chronological framework, to study trends in ivory and bone carving and consumption, and to create typologies of several classes of material for the city of Rome.

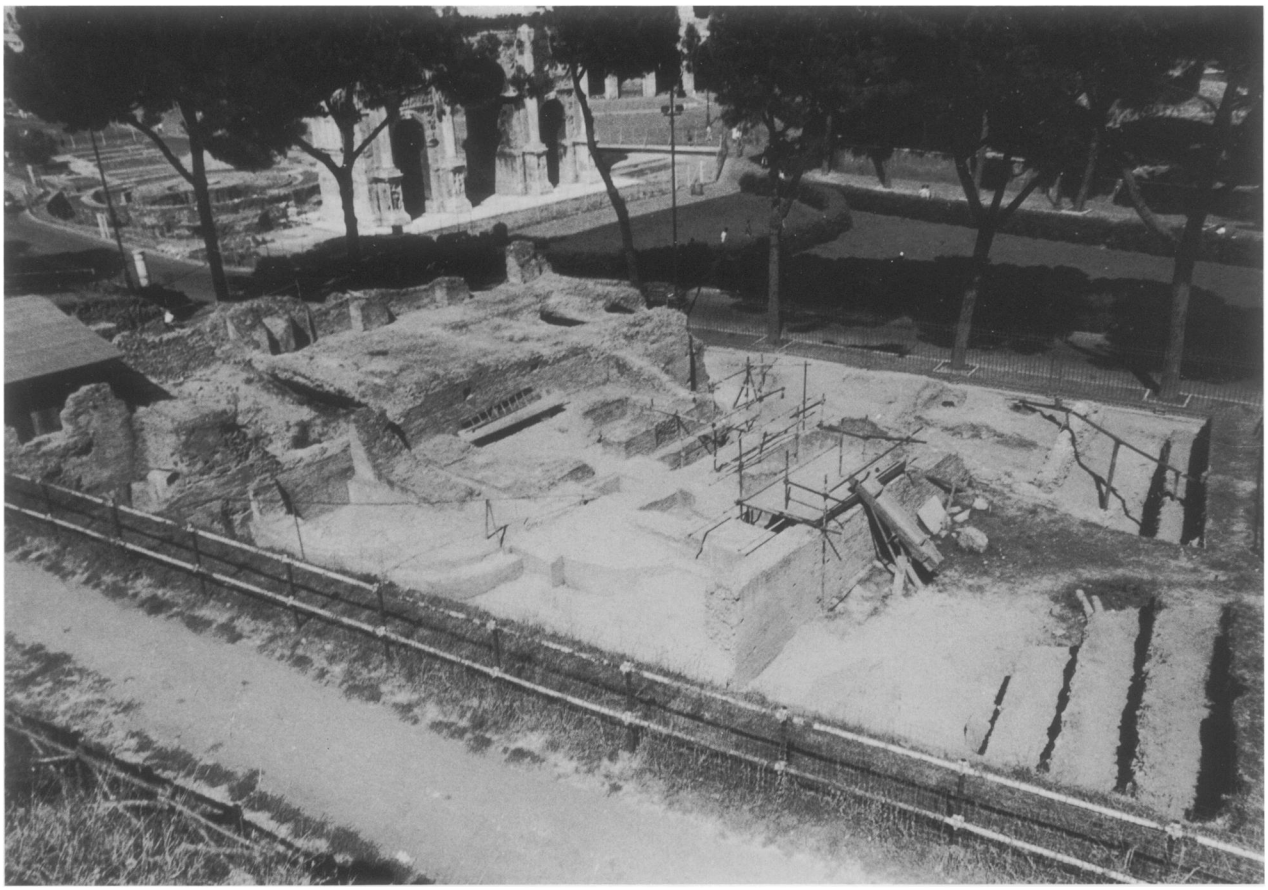
The late antique bone and ivory finds include plaques carved in relief and intaglio (Figs. 3, 4), thin strips that served as inlay or mounts (Fig. 5), pyxis fragments (Fig. 6), pins with decorated heads (both hand carved and lathe turned) (Fig. 7), ligulae, needles, jewelry, handles, gaming pieces (Fig. 8), and dice (Fig. 9).[6] The large number and variety of finds in

[4]The medieval history of the site, when several small abandoned churches are connected with the area, is discussed by J. R. Brandt in Hostetter et al., "A Late Roman *Domus,*" 177–78.

[5]For a preliminary discussion of results of pottery studies for this area, see the section by J. T. Peña in Hostetter et al., "A Late Roman *Domus,*" 154–60.

[6]Collections of Roman and late antique bone objects from several museums have been published. See, L. Mar-

1 Topographical plan of the northeast slope of the Palatine Hill, 1994



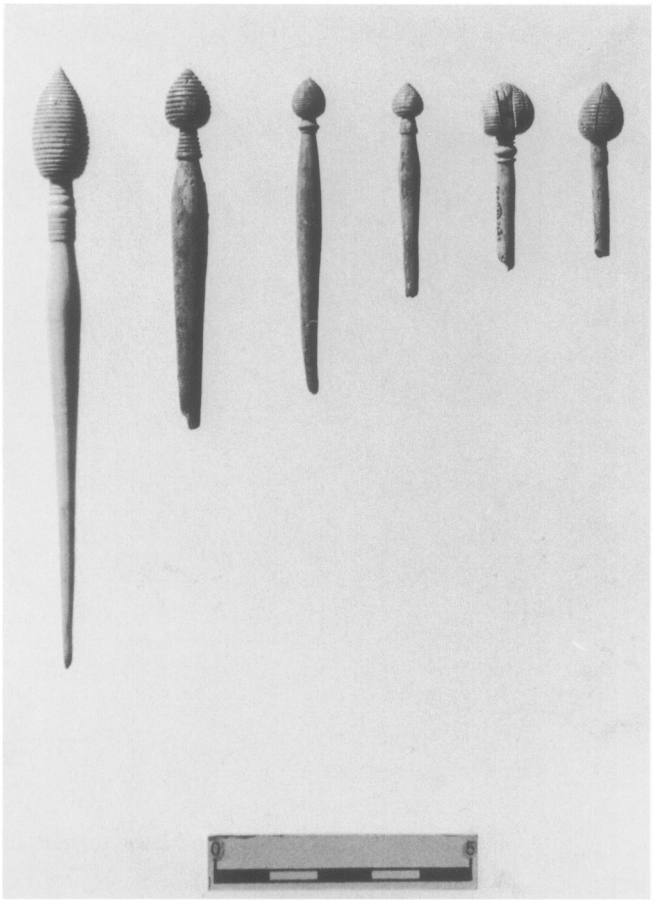
2 General view of the *domus* from the west (photo: Palatine East Excavation)

3 Plaque fragment, bone (photo: Palatine East Excavation)

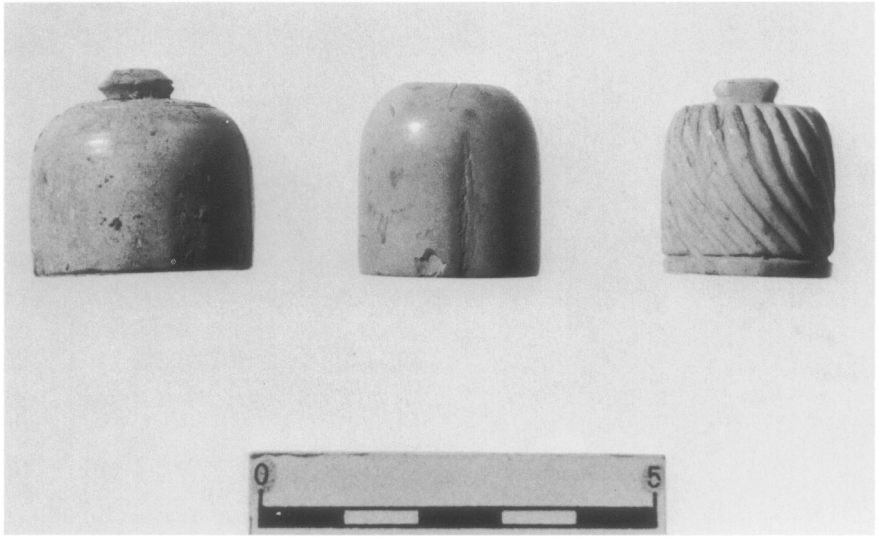
4 Plaques, carved in intaglio and lathe turned, bone (photo: Palatine East Excavation)

5 Inlays and mounts, bone (photo: Palatine East Excavation)

6 Pyxis fragment, bone
(photo: Palatine East Excavation)

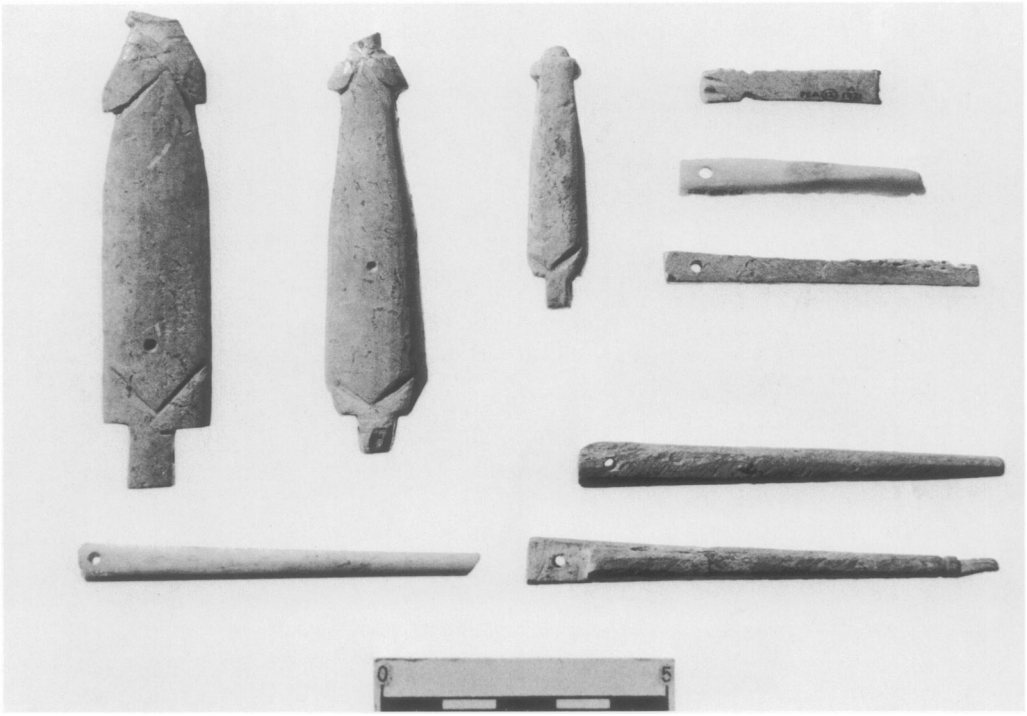


7 Pins with decorated heads, ivory and bone. Numbers 5 and 6 from the left are ivory heads mounted on bone shafts. Palatine East excavation
(photo: Palatine East Excavation)

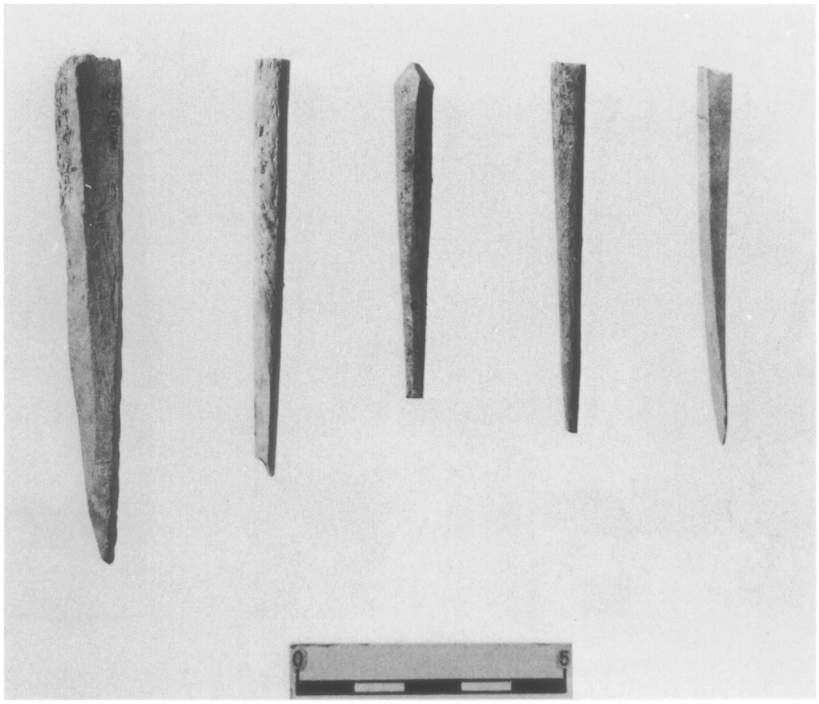


8 Gaming pieces, bone (photo: Palatine East Excavation)

9 Dice, ivory and bone. One die (*second from left, top row*) apparently broke while being hollowed out for loading (photo: Palatine East Excavation)



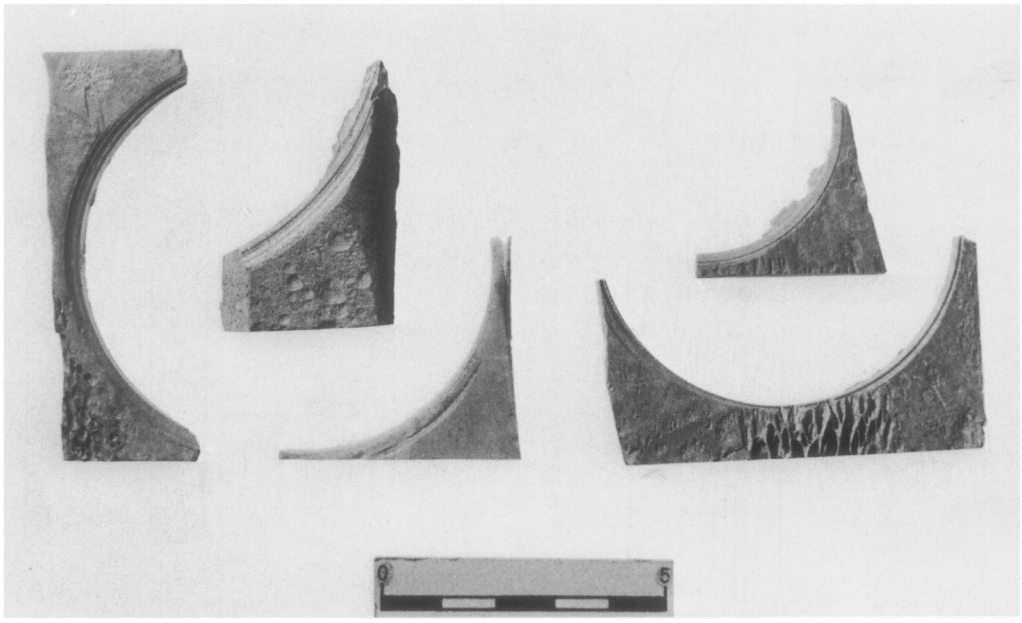
10 Dolls' bodies, arms and legs, bone (photo: Palatine East Excavation)



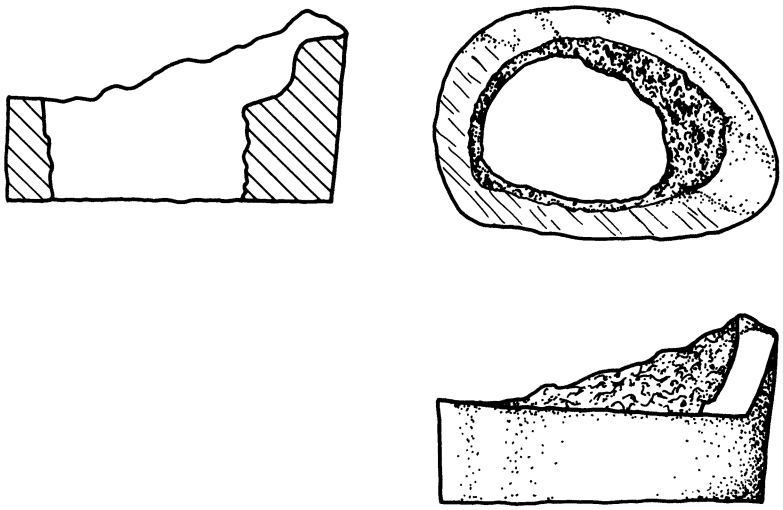
11 Blanks for pins, needles, etc., bone and ivory (photo: Palatine East Excavation)

12 Working debris, including an offcut (*lower left*), ivory (photo: Palatine East Excavation)

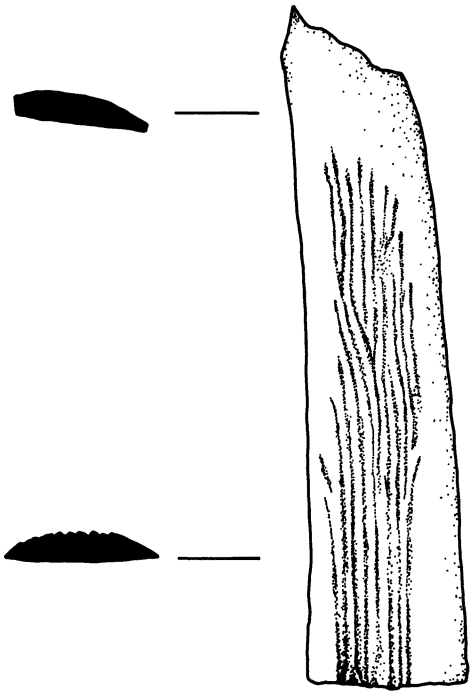
13 Working debris from lathe turning (*left and center*) and drilling (*right*), bone and ivory. One fragment (*center, bottom row*), may indicate the use of a compass (photo: Palatine East Excavation)



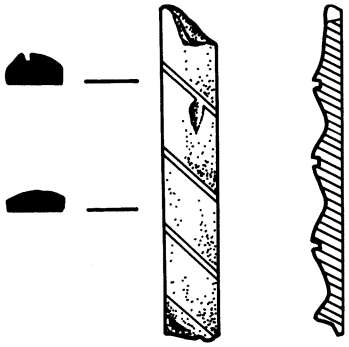
14 Offcuts, bone. The second piece from the right shows an oblique chisel cut made to help remove the blank from the disc (photo: Palatine East Excavation)



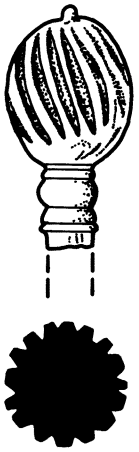
15 Working debris from a preliminary sawing: cross sections of a long bone showing a combination of the sawing and percussion used to separate the shaft from the epiphysis (drawing: Palatine East Excavation)



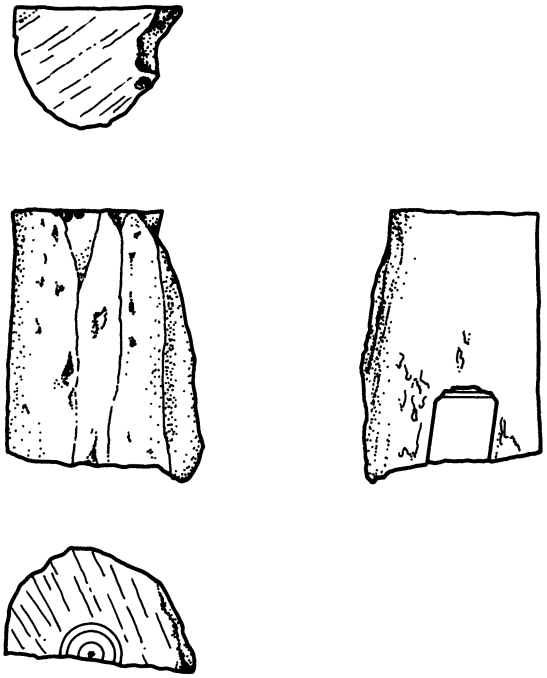
16 Blank for furniture or box mount scored with a toothed chisel, bone
(drawing: Palatine East Excavation)



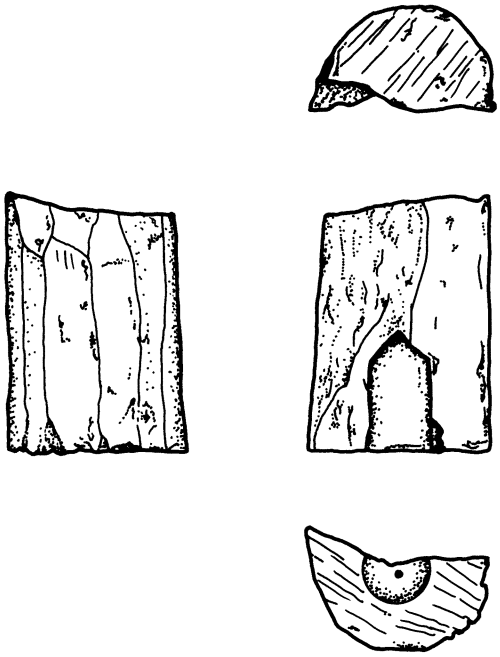
17 Furniture or box mount decorated with sawn parallel incisions
(drawing: Palatine East Excavation)



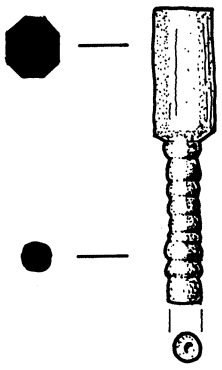
18 Pinhead, decorated by hand with a knife, on lathe-turned shaft, bone (drawing: Palatine East Excavation)



19 Working debris showing preliminary preparation of surface with chisel and center-bit drill hole, bone (drawing: Palatine East Excavation)



20 Working debris with chisel marks and twist or auger-bit drill hole, bone (drawing: Palatine East Excavation)



21 Partially lathe-turned blank with indentation from attachment to center stock, bone (drawing: Palatine East Excavation)

several classes, most notably pins, which are both decorated and undecorated, will provide for the first time securely dated comparanda for the city of Rome spanning a wide period.[7] Of special interest are the bodies and limbs of articulated dolls of a type associated occasionally with child burials, notably in the catacombs (Fig. 10).[8] Bone is the predominant material, but ivory is present in all classes.

Of equal importance is the concentration in these late antique contexts, as well as in the earlier contexts upslope, of a significant amount of carving debris, indicating the presence of a bone- and ivory-carving industry that appears to have functioned in the area for a considerable period of time. This evidence includes partially finished and rough-cut objects, blanks, discards—objects broken or damaged during the carving process—as well as debris in the form of the discarded articular ends of long bones, bone and ivory offcuts, and lathing debris (Figs. 11–14).[9] Although no actual bone and ivory workshop—if we define the word as a shop or building where work is done—has been discovered, several factors combine to show that this work was done locally, probably close by, over a long period, and on a scale that suggests a level of professionalism beyond that of the individual who may have carved objects to fill his personal needs.[10] First, the total number of objects is large and the range of types as well as the techniques used to create them is wide. It includes almost all classes of object that we know to have been worked in bone in late antiquity, from practical items, such as simple pins, to luxury items, such as jewelry and decorative mounts worked in intaglio, high and low relief, and in the round. Second, and equally important, is the evidence for the exploitation of elephant ivory, both in the form of finished objects and in the form of blanks and working debris, which provides the first direct evidence that ivory was worked in the city of Rome (Fig. 12).[11]

Evidence for ivory working is rare, despite the fact that its excellent working qualities recommended it for both utilitarian and luxury objects.[12] While recent scholarship has shown

angou, *Bone Carvings from Egypt,* I: *Graeco-Roman Period* (Tübingen, 1976); J. C. Béal, *Catalogue des objets de tabletterie du Musée de la Civilisation Gallo-Romaine de Lyon* (Lyon, 1983); idem, *Les objets de tabletterie antique du Musée archéologique de Nimes,* Cahiers des musées et monuments de Nimes 2 (1984); M. T. Biro, *The Bone Objects of the Roman Collection,* Catalogi Musei Nationalis Hungarici, Series Archaeologica 2 (Budapest, 1994).

[7] A typology of Romano-British pins on a small scale was undertaken by N. Crummy, "A Chronology of Romano-British Pins, *Britannia* 10 (1979), 157–63. A typology of Gallo-Roman pins, on a much larger scale, has recently been published by Béal, *Catalogue,* 183–235. The variety of types unearthed at Palatine East exceeds that of both publications.

[8] No heads have been found, and since the heads and bodies were usually one piece, this suggests that these dolls were discards from the manufacturing process. See the discussion by A. St. Clair in Hostetter et al., "A Late Roman *Domus*," 169.

[9] Bone- (but not ivory-) working evidence has been published from 4th-century Carthage. See V. Hutchinson and D. S. Reese, "A Worked Bone Industry at Carthage," in *The Circus and a Byzantine Cemetery at Carthage,* ed. J. H. Humphrey (Ann Arbor, 1989), 549–94. A summary of evidence for bone working at Carthage and other Mediterranean and northern European sites is provided on pages 560–62. For additional evidence of bone working, often on a small scale, see L H. Sackett et al., *Knossos: From Greek City to Roman Colony. Excavations at the Unexplored Mansion II* (London, 1992), 379–89; P. Wapnish, "Beauty and Utility in Bone: New Light on Bone Crafting," *Biblical Archaeology Review* 17.4 (1991), 54–57; E. Schmid, "Beindrechsler, Hornschnitzer und Leimsieder im römischen Augst," in *Provincialia: Festschrift für Rudolf Laur-Belart,* ed. E. Schmid, L. Berger, and P. Burgin (Basel, 1968), 185–97; N. Crummy, "Bone Working at Colchester," *Britannia* 12 (1981), 277–85; P. Holdsworth, "Saxon Southampton: A New Review," *Medieval Archaeology* 20 (1976), 26–61; A. von Driesch and J. Boessneck, "Tierknochenabfall aus einer spätrömischen Werkstatt in Pergamum," *AA* (1982), 563–74. Evidence for the working of skeletal material in the late Roman and medieval periods is collected in A. MacGregor, *Bone, Antler, Ivory, and Horn: The Technology of Skeletal Materials since the Roman Period* (London-Totowa, N.J., 1985), 44–54. Evidence for bone and ivory working in the form of blanks from Corinth has been published by G. R. Davidson, *Corinth XII: The Minor Objects* (Princeton, 1952), 174, 278, pls. 147b, 148b.

[10] The term "workshop" and its various definitions are discussed by W. Rudolph in "Workshops: Some Reflections and Some Pots," *Proceedings of the Third Symposium on Ancient Greek and Related Pottery. Copenhagen, August 31–September 4, 1987* (Copenhagen, 1988), 524–35. Evidence for bone working on a small scale has been found in numerous Roman excavations, especially in Britain and northern Europe, confirming the notion that simple utilitarian objects were often carved from bone by the user as required. See, above, note 7 and MacGregor, *Bone, Antler, Ivory, and Horn,* 44–54.

[11] Of the seven inscriptions from Rome, all dating from the 1st century B.C., that mention *eborarii,* five are associated with the area between the Porta Salaria and the Porta Pinciana, suggesting a possible early concentration of ivory workers in that area. See *La collezione epigrafica dei Musei Capitolini,* ed. S. Panciera (Rome, 1987), 92–94.

[12] For the raw material, see MacGregor, *Bone, Antler, Ivory, and Horn,* 14–19; A. Cutler, *The Craft of Ivory. Sources, Techniques, and Uses in the Mediterranean World: A.D. 200–*

that elephant ivory was both more readily available and less expensive in late antiquity than previously supposed, nonetheless it remained a luxury material; its purchase involved a significant investment and the presumption of a clientele that appreciated its special qualities.[13] Finally, the Palatine East bone and ivory material implies the ownership of somewhat specialized tools, including lathes, chisels, gouges, fine saws, drills, and a variety of knives, suggesting a level of professionalism beyond that encountered at sites where small-scale evidence of bone working, presumably by individuals, has been documented.[14]

While the building or setting in which this work was carried out has not been identified, it was likely nearby. The layers with bone and ivory in stratigraphic sequence that were dumped over and around the rooms to the south of the apsidal hall and in the barrel vaults below it represent primarily materials used and discarded over a short period of time, perhaps no more than a few decades each.[15] That such material was repeatedly brought in from some distance as fill is possible, but unlikely, especially in light of the discovery of additional working debris in separate deposits dating to the late first and early second centuries in association with structures upslope. These deposits point to a long history of ivory and bone working in the area. It is perhaps relevant to note that the ivory- and bone-working debris from the recently discovered workshop of Phidias at Olympia, distant in time but in some ways remarkably similar to the material from Palatine East, also came not from within the building itself but, as would be expected, from a series of dumps outside its walls.[16]

The amount of debris from bone carving is far greater than that from ivory. This tells us little, however, about the relative amounts carved. Bone carving, which relied on a readily available raw material, produced large amounts of debris from parts of bones that were not utilized, the articular ends for example or cancellous areas.[17] Ivory from the tusks of elephants, both more valuable and more fully workable, generated comparatively little debris.[18] While the amount of the highest quality ivory within a given tusk that might be exploited for plaques or pyxides was limited, even the smallest leftover pieces could be and were carved, for example, for dice or for pinheads that were then mounted on bone shafts (Fig. 7). Within the setting suggested by the Palatine East material where bone and ivory were worked together, even the smallest bits of ivory are likely to have been put to good use. Once again, the working debris from Phidias' workshop, where the great chryselephantine statue of Zeus was presumably made, provides a relevant comparison. There too, surprisingly, debris from bone carving far outnumbered ivory carving debris.[19] A second factor contributing to this discrepancy is undoubtedly the inherent fragility of ivory. While bone survives relatively well buried underground in a variety of climates, ivory is notably sensitive to changes in humidity and temperature. Desiccation makes it extremely friable and subject to disintegration. The ivory recovered from Palatine East contexts was invariably in poor condition and fragmentary, and usually in various stages of decomposition, conditions aggravated by the inevitable disturbance caused by excavation.[20] It is likely that a good deal of material, especially carving debris, disintegrated while buried underground.

While it is the finished object that traditionally attracts the viewer, any attempt to define

1400 (Washington, D.C., 1985), 1–19; idem, "Five Lessons in Late Roman Ivory," *Journal of Roman Archaeology* 6 (1993), 167–92; J. Engemann, "Elfenbeinfunde aus Abu Mena/Ägypten," *JbAC* 30 (1987), 172–86; F. von Bargen, "Zur Materialkunde und Form spätantiker Elfenbeinpyxiden," *JbAC* 37 (1994), 45–62.

[13] Cutler, *The Craft of Ivory,* 20–37.

[14] MacGregor, *Bone, Antler, Ivory, and Horn,* 44.

[15] See Peña in Hostetter et al., "A Late Roman *Domus*," 154–60.

[16] W. Schiering, *Die Werkstatt des Pheidias in Olympia,* II: *Werkstattfunde,* Olympische Forschungen 18 (Berlin-New York, 1991), 159–62. The late antique evidence for bone working from Carthage also comes from a series of dumps, outside the back wall of the circus. See Hutchinson and Reese, "A Worked Bone Industry," 549–51.

[17] Bone as a raw material is considered in detail by MacGregor, *Bone, Antler, Ivory, and Horn,* 1–9.

[18] On the availability and suitability for carving of bone and ivory, see A. St. Clair and E. P. McLachlan, *The Carver's Art: Medieval Sculpture in Ivory, Bone, and Horn* (New Brunswick, N.J., 1989), 1–10; Cutler, *The Craft of Ivory,* 1–6.

[19] Schiering, *Die Werkstatt des Pheidias,* 161–62.

[20] The use of fossilized ivory from mammoth tusks has been suggested to explain the appearance of ivory "bag" rings in 5th- and 6th-century Saxon graves, but whether such long-buried material would remain carvable is disputed. See MacGregor, *Bone, Antler, Ivory, and Horn,* 39–40.

the late antique setting for bone and ivory carving—specifically the existence and location of workshops, as well as techniques and tools of the trade—is likely to be more successful if approached through the examination of concentrations of working debris or of objects abandoned in the course of production because of breakage or some other factor. Although in the preliminary stages, study of the Palatine East material has the potential of allowing us to visualize more clearly working procedures and workshop practices on the artisanal level in late antique Rome than hitherto has been possible.[21] It provides, for example, valuable evidence for the use of tools and of procedures. Unless broken or rendered unusable, tools are unlikely to be found in association with carving debris, and they rarely can be associated with a particular purpose. As a result, evidence for carving techniques and for the tools employed has relied on somewhat fanciful medieval miniatures[22] or on minute examination of the finished object, from which tool marks often have been intentionally obliterated by final polishing.[23] At Palatine East, handles of bone and ivory as well as remains of metal implements were excavated from contexts containing bone and ivory. Analysis of the metalwork, which is poorly preserved, is in the preliminary stages and may or may not prove useful. The carving debris, however, provides direct evidence of tools and working methods.

Discarded epiphyses and transverse slices of long bones in the form of rings, which are also discards (Fig. 15), provide evidence for the use of coarse and fine saws with blades of varying widths and of a progression from coarse sawing, often combined with percussion in the removal of the epiphyses, for example, to precise and careful sawing at right angles to the long axis when the bone is cut to measure.[24] Evidence for the use of straight-edged chisels, often with the "stop and go" marks that indicate use in combination with a mallet, is provided by numerous blanks and unfinished objects and indicates a preference for the chisel over the saw when working parallel to the grain (Figs. 11, 13, 19). The toothed chisel, also applied parallel to the grain and used to roughen the back surfaces of plaques for better adhesion (Fig. 16), more often was pushed across the surface. Knives with a variety of blade sizes are also well attested on objects ranging from the simplest, where the V-shaped incision distinguishes the use of the knife from the shaped incision left by a saw (Fig. 17), to the most intricate, such as elaborate pinheads (Fig. 18) and plaques carved in relief. Drill holes testify to the use of both center bits, in which the cutting element describes an arc around a point leaving a characteristic cylindrical hole with a central indentation (Fig. 19), and twist or auger bits, which leave a hole that is ogival or conical in form (Fig. 20).[25] Implements of the center bit type were used as well for the ring and dot motifs that are both common decorative motifs and mark the values on dice (Fig. 9).[26]

Palatine East is especially rich in lathe-turning evidence.[27] Not only do finished objects display the remarkable skill of the artisan working on a very small scale, in the decoration of pinheads, for example (Fig. 7), but unfinished pieces and debris in bone and ivory testify to the use of the lathe for a variety of objects. Finished and unfinished objects frequently retain the characteristic indentation where the matrix was attached to the lathe

[21] The best study of Roman bone working to date is Béal, *Catalogue*, 20–43, with extensive bibliography. See also, MacGregor, *Bone, Antler, Ivory, and Horn*, 55–72; Hutchinson and Reese, "A Worked Bone Industry," 556–62; Wapnish, "Beauty and Utility in Bone," 54–57; St. Clair and McLachlan, *The Carver's Art*, 7–10. Roman workshop practices for ivory, although presumably similar, have not been documented. For Greek evidence, see Schiering, *Die Werkstatt des Pheidias*, 159–60.

[22] See for example the 11th-century Venice, Bib. Marciana, cod. gr. Z479, fol. 36r, reproduced in Cutler, *The Craft of Ivory*, 38.

[23] Cutler's close scrutiny of a large group of ivories has produced impressive evidence of the variety of tools employed in late antique and Byzantine ivory carving: *The Craft of Ivory*, 37–50; idem, *The Hand of the Master: Craftsmanship, Ivory and Society in Byzantium (9th–11th Centuries)* (Princeton, 1994), 79–152.

[24] There is little mention in epigraphy or in antique texts of techniques. Plutarch states that bone and ivory could be softened and cut with a wire, but there is no direct evidence at Palatine East or elsewhere of this technique: An vitos ad intel suffic. 4, ed. Loeb, trans. W. C. Helbold (Cambridge, 1954).

[25] For comparable evidence, see Béal, *Catalogue*, 27.

[26] For examples of center bits or scribing tools, see MacGregor, *Bone, Antler, Ivory, and Horn*, 60–61, fig. 38.

[27] Evidence for bow and continuous-rotation lathes is discussed by MacGregor, *Bone, Antler, Ivory, and Horn*, 58–59. See also, H. Hodges, *Artifacts: An Introduction to Early Materials and Technology* (London, 1976), 117–18; Hutchinson and Reese "A Worked Bone Industry," 560–61.

stock (Fig. 21), while unfinished pieces allow us to follow the progression from the preliminary shaping of the matrix with a chisel to attachment to the lathe stock, and finally through the turning process (Figs. 13, 21).[28] Debris from the turning of flat or concave surfaces is especially prevalent, particularly in the earliest layers upslope, where it is the dominant form of debris.[29] It takes the form of segments of roughly square—in the case of bone (Fig. 14)—or circular—in the case of ivory (Fig. 12)—offcuts, the debris remaining after the disc had been shaped using the lathe and freed from its blank, often with the aid of two oblique chisel cuts that effectively break the blank in half. The presence of considerable lathing debris of this sort distinguishes the Palatine East material from that of Phidias' workshop, where the ivory debris is primarily in the form of longitudinal slices, reflecting the presumed use of thin longitudinal plates or slabs of ivory for the exposed body parts of the chryselephantine sculpture.[30]

Documentation and evaluation of the Palatine East bone and ivory in relation to other finds from the site is still in the preliminary stages. Results of pottery and coin analyses, as well as analyses of other finds, such as animal bone and metalwork,will provide valuable evidence for a more precise understanding of the material as will further analysis of the architectural complex of the late antique *domus,* particularly its relation to contemporary and earlier structures excavated upslope. It is hoped that the excavated bone and ivory material will be of interest to scholars involved in the study of workshop practices, patterns of consumption, and carving techniques during a period when ivory and bone were major media for the creation of both artifacts and works of art.

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[28] Frequently the matrix is longer than the object and sawn off so that no indentation is present on the finished object. For a description of the procedures associated with lathe turning, see Béal, *Catalogue,* 30–34.

[29] Similar evidence in bone, but not ivory, survives from Carthage (Hutchinson and Reese, "A Worked Bone Industry," fig. 68) and Ashkelon (Wapnish, "Beauty and Utility in Bone," 56).

[30] Schiering, *Die Werkstatt des Pheidias,* 160.